

# **WMA Blue Ribbon Panel: Cost Issues**

Duane LeVangie

Water Management Program Chief

MassDEP

October 20, 2006

# Cost & Revenue Impacts

- Performance Standards vs. O&M Costs
- Avoided Costs (offsets, new sources, wastewater disposal etc..)
- Revenue Impacts
  - Rates adjustments necessary over time
  - Vary by Performance Standard, rates
  - Most dramatic to those furthest from the Standards
- Implementation Costs
  - Education Programs
  - Enforcement Costs
  - Program Costs
- DEP's Primary Enforcement Response- Compliance Schedules
- Funding Mechanisms (Water Banks, Conservation/hook-up fees, DEP Grants)

# Why conserve water?

---

- Cost savings
  - Lowering water production and/or distribution costs will save the utility and its customers money in reduced operation costs and possibly deferred capital costs.
- Wastewater treatment and disposal benefits
- Environmental benefits
- Utility stewardship and sustainability
  - Stretch existing supply; more economic activity can occur on the same water resource.
- Energy savings
- Improved supply reliability
- Customer benefits
- Regulatory compliance
- Public perception

---

Source: AWWA, 2006, Water Conservation Programs – A Planning Manual, Manual of Water Supply Practices, M52

# Other Perspectives on Benefits and Costs

It is crucial to review efficiency measures from other perspectives, namely the customer and other organizations.

- Customer

Efficiency measures that result in hot water savings, such as efficient showerheads, saves the customer on energy bills and water bills.

- Stormwater Utilities

Reductions in outdoor irrigation that prevents runoff containing pesticides and fertilizers are beneficial. Irrigation peak day water use is the most significant capital cost to water utilities.

- Wastewater Utilities

Reductions in indoor water use leads to less wastewater which results in cost savings from lower energy and chemical usage.

- Solid Waste Utilities

Less irrigation and appropriate dense landscapes result in less green waste, which saves on trucking and disposal costs.

---

Source: AWWA, 2006, Water Conservation Programs – A Planning Manual, Manual of Water Supply Practices, M52

# **Performance Standards**

## **Residential Gallons Per Capita Day (RGPCD) & Unaccounted-For-Water (UAW)**

- 2 full calendar years to comply
- Compliance Plan for exceeding after 2 full years
- Enforcement forbearance until the next permit renewal or 5-year review.
  - Do not exceed the enforcement margin.
  - Comply with Plan
  - Timely file ASR and other requirements
  - Continue to demonstrate progress

# **RGPCD Compliance Plan**

Must include one of the following programs:

- Provide water saving devices at cost
- Provide rebates or incentives for purchase of low water use appliances
- Require moisture sensors or similar climate control technology on automatic irrigation systems

# **UAW Compliance Plan**

## **Individualized Plan**

- Supplier's Choice

## **BMP Plan**

Must include:

- Leak detection
- Water meter inspection
- Monthly or quarterly billing
- Water pricing structure that covers full cost of operation

# Other performance standards

## Summer Limits on Withdrawals

- Two Options
  - Calendar Trigger (May – Sept.)
  - Stream Flow Trigger

## Offsets for Withdrawal Increases (High & Medium Stress)

- **Offsets may include:** stormwater management, LID, I/I removal, private well regulation, conservation, wastewater return, others?
- **Offset Feasibility Study and Implementation**
  - Required for increased water use
    - High- conduct study 1st time exceeding BL/ after 1 full year
    - Medium- conduct study 1st time exceeding BL/ after 2nd full year
  - Implement the results of the Study upon exceedence of baseline in any future ASR



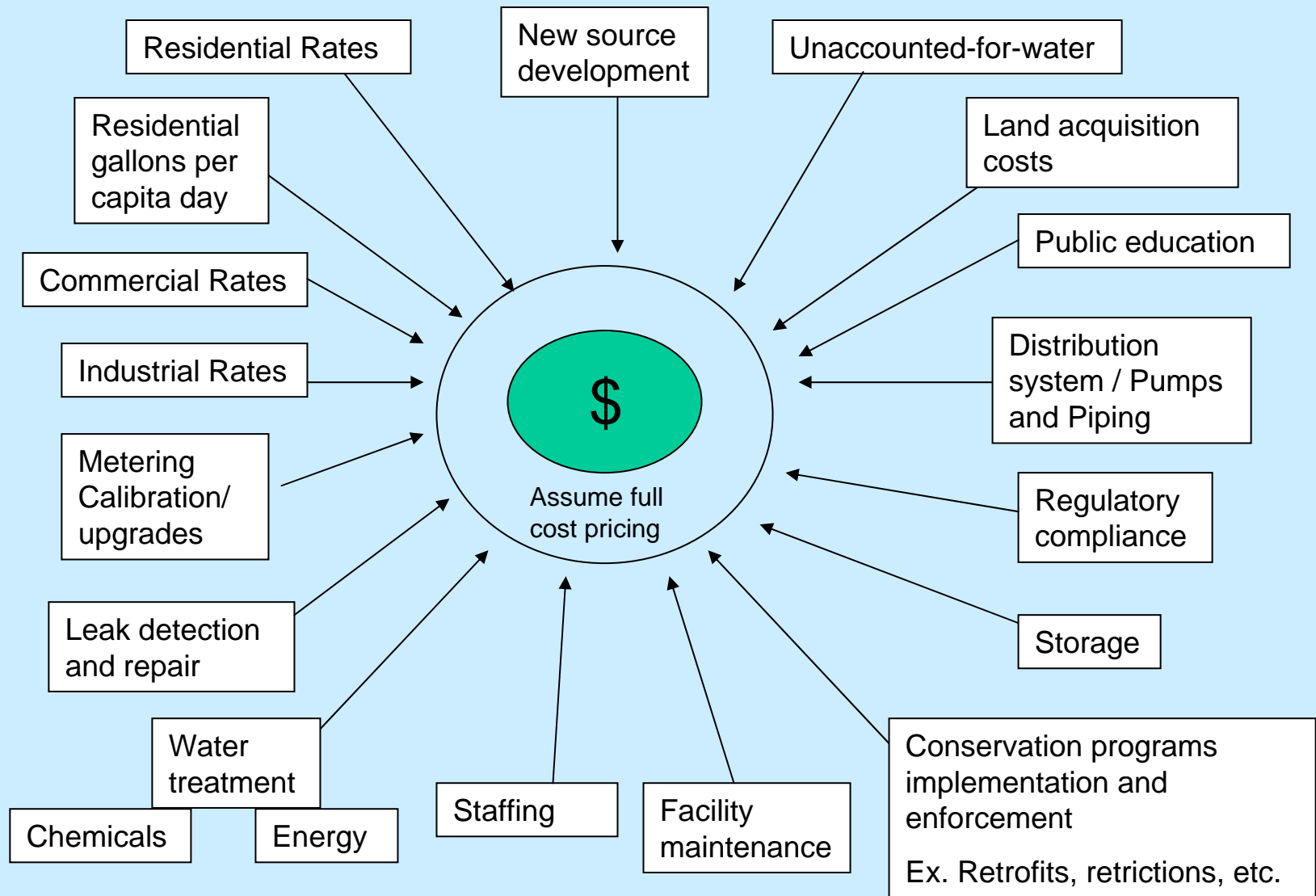
# Allocated Volumes

Town	Registered Volume, mgd	Permit Volume, mgd, by Period				Actual Use, mgd			
		One	Two	Three	Four	2003	2004	2005	3-yr Avg
Middleborough	1.53	2.25	2.42	2.73	3.03	1.53	1.70	1.65*	1.63
Bridgewater	1.66	1.91	2.06	2.23	2.4	1.67	1.71	1.74*	1.71
East Bridgewater	0.85	1.08	1.13	1.17	1.21	1.17	1.23	1.18*	1.19
Franklin	1.99	2.80	3.23	3.64	4.10	3.05	2.93	2.71	2.90*
Sharon **	1.10	1.66	1.73	1.78	1.83	1.56	1.49	1.61	1.55

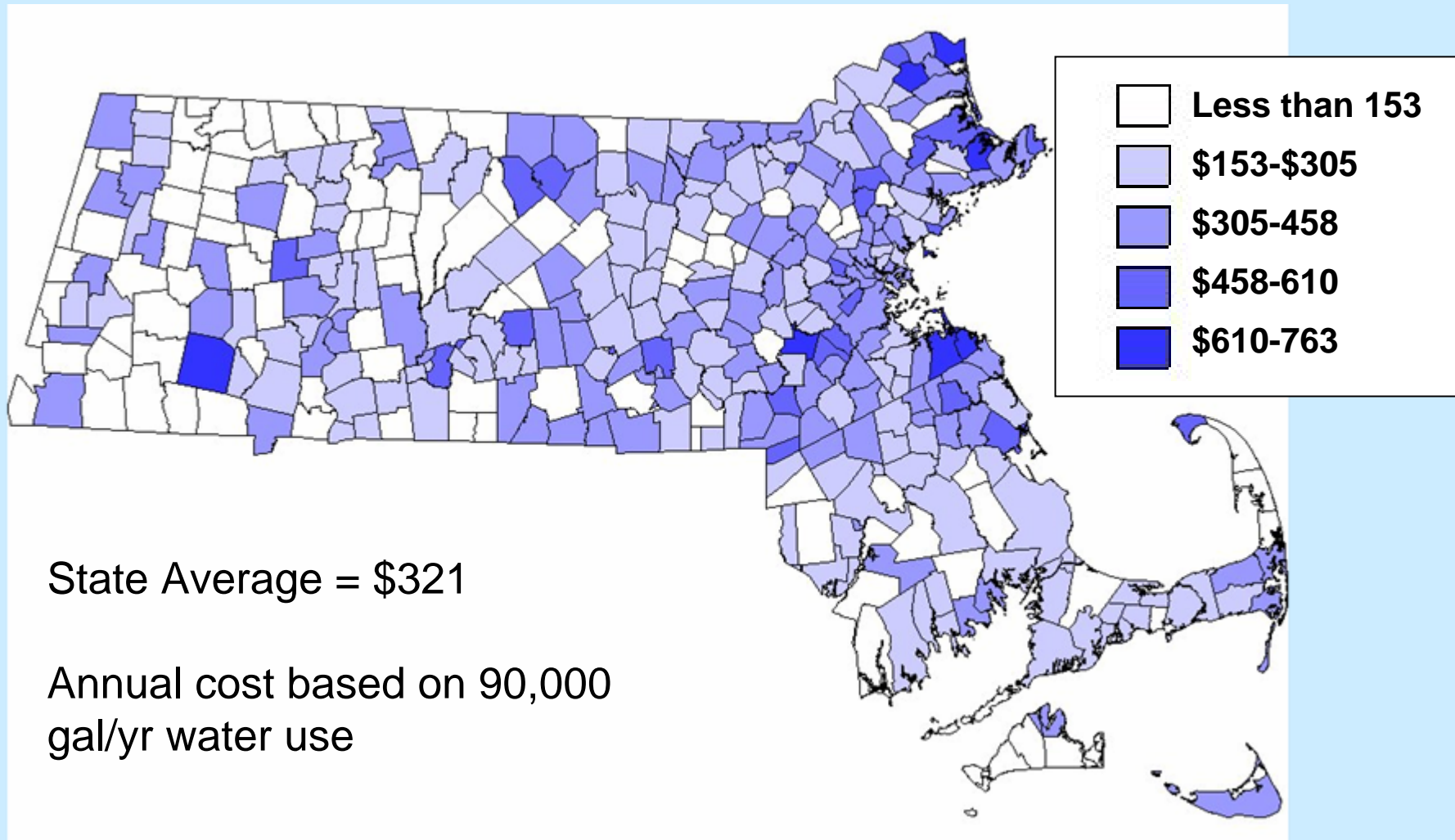
\*Baseline volume = largest value among registered volume, 2005 volume, or 3-year average (if in compliance)

\*\*Two basins

# Water Costs



# 2004 Annual Household Costs



Reference: Tighe & Bond, 2004 Water Rate Survey: Massachusetts Communities

# Baseline Operational Expenses or Conservation Costs?

Project	Year	Costs
Main St. water main replacement	2005	\$150,000
Water main replacement - various	2005	\$300,000
Water tank study and design	2005	\$50,000
Water main replacement - various	2003	\$275,000
Well improvements (Well No. 6-1)	2003	\$25,000
Maple St. booster	2003	\$550,000
Main St. water main replacement	2003	\$1,500,000
Well improvements (Well No. 6-2)	2003	\$30,000
Water system design	2002	\$75,000
South Well rehab	2002	\$155,000
Land purchase Maple St. booster	2001	\$75,000
Grass Hill water tank	1999	\$977,175
Water system Y2K	1999	\$108,000
<b>Total</b>		<b>\$4,270,175</b>

Actual Town submittal of WMA/conservation costs in 2006

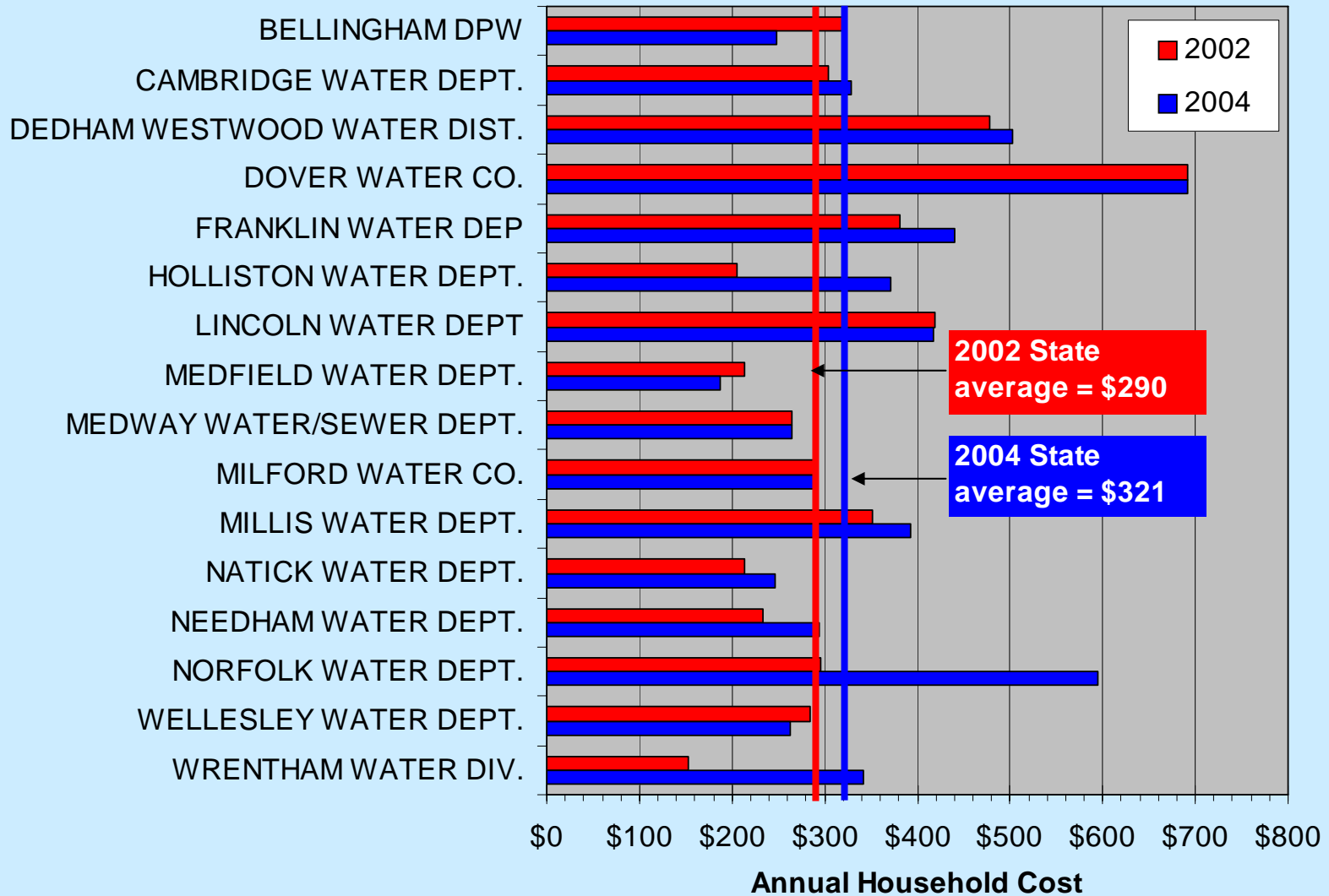
# Cost for New Source Development

Item	Cost (1999 dollars)
Test well exploration	\$25,000
Surveys, wetlands delineation	\$12,000
Filing (ConCom, MEPA)	\$5,000
Site exam, pumping test design proposal	\$55,000
5-day pumping test	\$18,000
Zone II delineation, modeling, reporting	\$165,000
Permitting (DWP, WMA)	\$30,000
Production well design	\$85,000
Production well construction	\$350,000
<b>Total</b>	<b>\$745,000</b>
+ land acquisition for Zone I	varies
+ chemical treatment (Fe, Mn)	\$175,000-\$1,800,000
+ Interbasin transfer permit, if applicable	\$20,000-120,000
+ water main construction	varies
+ legal costs	varies

For sources pumping 100,000 gpd or greater

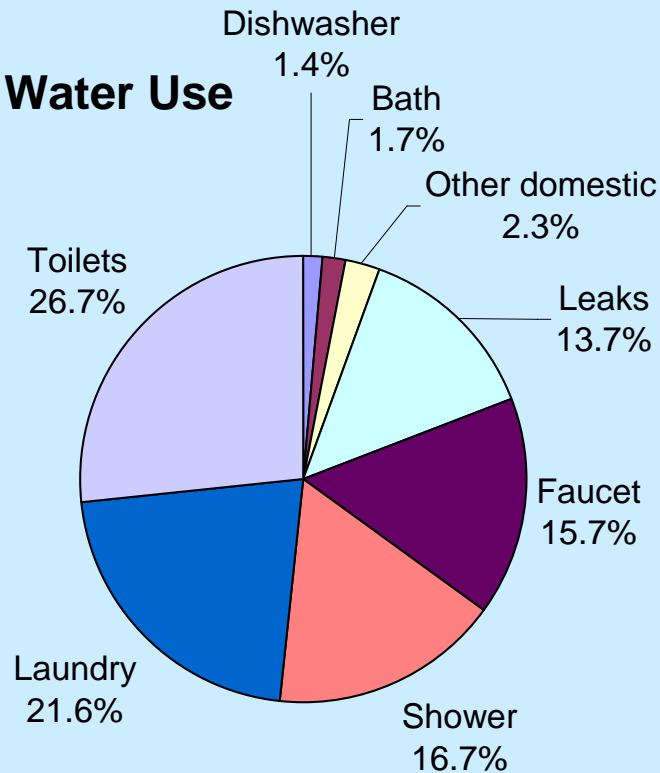
Modified from data compiled from consultants familiar with source development requirements

# Charles River Basin Water Rates



Reference: Tighe and Bond 2002 & 2004 Water Rate Surveys: Massachusetts Communities  
cost based on 90,000 gal/yr water use

## Residential Indoor Water Use



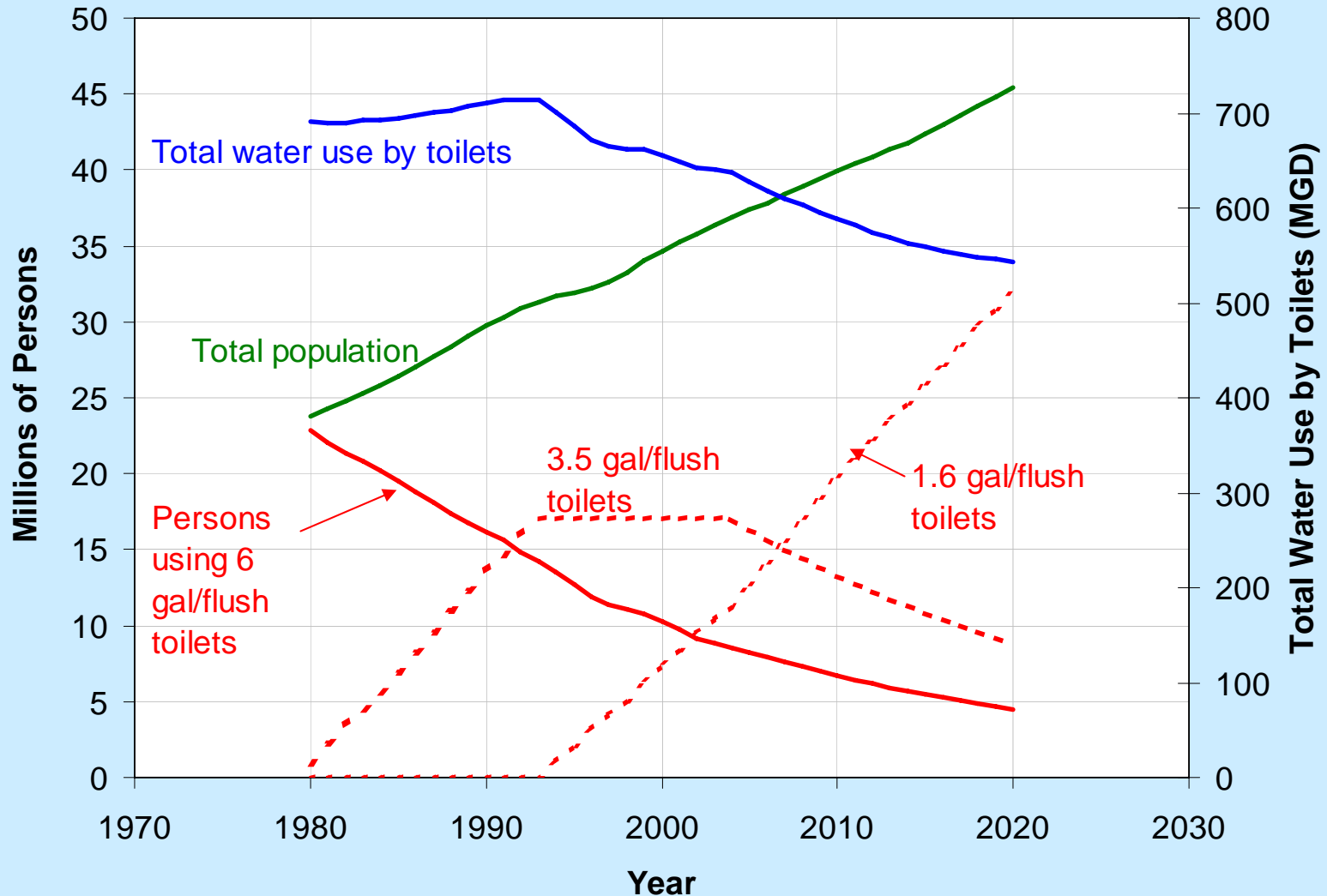
- Typical breakdown of residential water use, based on 12 locations (AWWA, 1999, Residential End Uses of Water)
- **Toilets, clothes washers, showers** consume largest volumes of water in a typical household
- Targeting retrofitting of these fixtures could lead to substantial water savings

# Water Savings from Toilet Retrofitting

Reference	Location	Amount saved (gpcd)	Method
Vickers, A., 2001, Handbook of water Use and Conservation	Barrie, Canada	16.4	Calculated from billing
	New York, NY	9.3	Water use records
	Seattle, WA	10.9	Direct measurement
Government Accounting Office, 2000, Water Infrastructure: Water Efficient Plumbing Fixtures Reduce Water Consumption and Wastewater Flows, GAO/RCED-00-232	Boulder, CO	8.3	Direct measurement
	East Bay Municipal District, CA	5.3	Direct measurement
	Seattle, WA	10.6	Direct measurement
	Tampa, FL	6.1	Direct measurement
Jordan Valley Water Conservancy District, 2003, Residential ULFT Replacement Program Report	West Jordan, UT	8.0	Direct measurement
AWWA, 1999, Residential End Uses of Water	Composite from 12 sites	10.5	Direct measurement
Average water savings		9.5	



# California Water Use by Toilets (natural replacement and existing utility programs)



Reference: Pacific Institute, 2003, Waste Not Want Not: The Potential for Urban Water Conservation in California

# **Franklin**

## **Development Related Issues**

- Mid 1990's – Drawdown impacts to Kingsbury Pond identified. Pond reduced from 26 Acres to 9.
- Late 1990's – Sewer Expansion Proposal
- December 27, 1998 Boston Globe Featured Story states Franklin - Population increased by 10,000 in past 10 years

## **Permitting Chronology**

- July 11, 1997 – MEPA Certificate on the ENF for State Forest Well No. 11: EIR Not Required
- November 1997 – WMA Permit Filed for Wells No. 11 and 12
- February 9, 1998 – MEPA Certificate on the ENF for Populatic Street Well No 12: EIR Not Required

# Franklin's Water Use 1992 - 2005

